Chroma-Q™

Color Force™ 12

User Manual

Chroma-Q™
BRILLIANT SOLUTIONS

Version 1.4 September 2012, Software Version 1.9
PN: 621-0500

Warranty Statement

Chroma-Q warrants to the original purchaser, with proof of purchase, that its delivered products shall be free from defects in material and workmanship under normal use for a period of 12 months from date of shipment.

Chroma-Q will repair, or at its option, provide an equivalent item or replace, the defective product during the stated warranty period. This warranty applies only to the repair or replacement of the product and only when the product is properly handled, installed and maintained according to Chroma-Q instructions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. Purchaser must notify Chroma-Q in writing within 14 days of noticing the defect. This warranty excludes field labour or service charges related to the repair or replacement of the product.

The warranty contained herein shall not extend to any finished goods or spare parts from which any serial number has been removed or which have been damaged or rendered defective (a) as a result of normal wear and tear, willful or accidental damage, negligence, misuse or abuse; (b) due to water or moisture, lightning, windstorm, abnormal voltage, harmonic distortion, dust, dirt, corrosion or other external causes; (c) by operation outside the specifications contained in the user documentation; (d) by the use of spare parts not manufactured or sold by Chroma-Q or by the connection or integration of other equipment or software not approved by Chroma-Q unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (e) by modification, repair or service by anyone other than Chroma-Q, who has not applied for and been approved by Chroma-Q to do such modification, repair or service unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (f) due to procedures, deviating from procedures specified by Chroma-Q or (g) due to failure to store, install, test, commission, maintain, operate or use finished goods and spare parts in a safe and reasonable manner and in accordance with Chroma-Q's instructions (h) by repair or replacement of engines without factory training.

The warranty contained herein shall not apply to finished goods or spare parts which are sold "as is", as "second-hand", as used", as "demo" or under similar qualifications or to Consumables ("Consumables" is defined as any part(s) of goods or part(s) for use with goods, which part(s) of goods or part(s) for use with goods are consumed during the operation of the goods and which part(s) of goods or part(s) for use with goods require replacement from time to time by a user such as, but not limited to, light bulbs).

The warranty contained herein shall not apply, unless the total purchase price for the defective finished goods or spare parts has been paid by the due date for payment.

The warranty contained herein applies only to the original purchaser and are not assignable or transferable to any subsequent purchaser or end-user.

This warranty is subject to the shipment of the goods, within the warranty period, to the ChromaQ warranty returns department, by the purchaser, at the purchasers expense. If no fault is found, ChromaQ will charge the purchaser for the subsequent return of the goods.

Chroma-Q reserves the right to change the warranty period without prior notice and without incurring obligation and expressly disclaims all warranties not stated in this limited warranty.

Disclaimer

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Chroma-Q products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent. Chroma-Q sole warranty is that the product will meet the sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

Chroma-Q reserves the right to change or make alteration to devices and their functionality without notice due to our on going research and development.

The Chroma-Q Color Force 12 has been designed specifically for the lighting industry. Regular maintenance should be performed to ensure that the products perform well in the entertainment environment.

If you experience any difficulties with any Chroma-Q products please contact your selling dealer. If your selling dealer is unable to help please contact support@chroma-q.com. If the selling dealer is unable to satisfy your servicing needs, please contact the following, for full factory service:

Outside North America:
Tel: +44 (0)1494 446000
Fax: +44 (0)1494 461024
support@chroma-q.com

North America:
Tel: 416-255-9494
Fax: 416-255-3514
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For further information please visit the Chroma-Q website at www.chroma-q.com.

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The rights and ownership of all trademarks are recognised.

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1. Product overview

The Color Force 12 is a truly multi-purpose LED fixture that is suitable for numerous entertainment lighting disciplines. The unit provides power across the spectrum, from deep cold blues to red hot lava looks all from a single fixture. At only 300mm / 1ft long, the unit is ideal for floor, wall or truss mounting. It also provides a massive output of 2,400 hot lumens, easily washing up to 8m / 26ft with smooth, theatrical grade dimming.

The Color Force 12 is equipped with a built-in power supply and can operate as a stand-alone unit or be remotely controlled through ANSI E1.11 USITT DMX 512-A protocol. The Color Force 12 features a total of 48 high powered LEDs (2 x 1200 lumen RGBA cells).

The control options incorporate a choice of HSI (Hue, Saturation and Intensity), RGBA (Red, Green, Blue, Amber), RGB(A) (Red, Green, Blue, with *Magic Amber), RGBI (Red, Green, Blue with *Magic Amber and Intensity), sRGBI (with intensity effects) and sRGBA (with intensity effects) control modes. The Color Force 12 also features a dynamic Variable Effects Engine integrated in the software, which gives the lighting designer full control over colour and effects combinations.

The product's robust anodised aluminum extruded construction houses a discreet cable management system. Additional protection is built around the lenses for a truly road proof fixture.

2. Operation

2.1 Unpacking the units

The Color Force 12 package includes 1 unit Color Force fixture, power connector (EU)/power cord (US) and a Quick Start Guide. We recommend that you keep the original packaging in case the item needs to be returned.

2.2 Cabling

The Color Force 12 utilises PowerCon connectors for power input and through. The DMX control data input and through connections from an external control console are via two XLR 5-pin connectors. The chassis are ground bonded.

Note: To avoid overloading the input cable, the maximum length of Color Force 12 fixtures for a single power cable run is 3.6m (12') at 110V or 7.2m (24') at 220V.

XLR 5-pin Cable:

Pin#	Function
1	Ground (Screen)
2	Data Minus
3	Data Plus
4	Spare Data Minus
5	Spare Data Plus

Power Cable:

International Colour Code	North American Colour Code	Connections	
Green and Yellow	Green	Earth (E)	Ground (Green)
Blue	White	Neutral (N)	Neutral (Silver)
Brown	Black	Live (L)	Hot (Gold)

Important Notice:
The use of an opto-splitter for DMX signal distribution is highly recommended when several fixture units are not plugged into the same power source.

2.3 Mounting

The Color Force 12 fixture is equipped with a built-in mounting yoke for floor, wall and truss mounting applications. The yoke assembly features a hidden quick release fixing for fast and easy tilt adjustment.

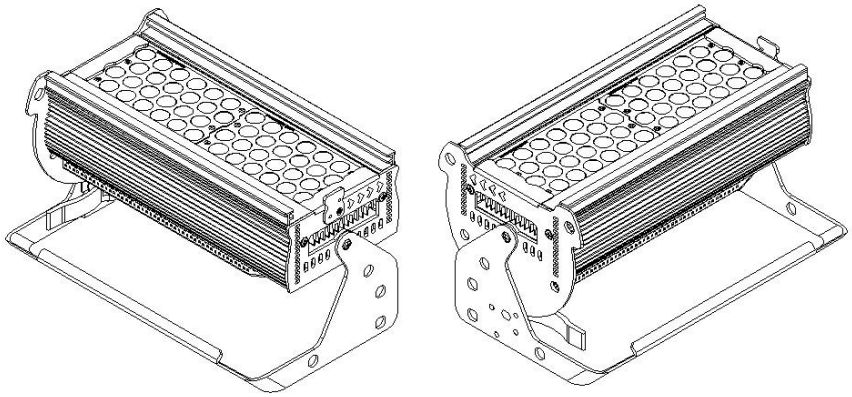
Note: Secure the fixture with a safety bond. A provision for a fixing hold is built into the yoke.

2.4 Optical Accessories

Slide-in optical accessories are available to adjust the light output of the Color Force 12 fixture to suit a wide range of applications. Two accessory slots and a swivel plate are included at the front and side of the fixture to hold and lock these slide-in lenses, barndoors, egg crates, half hats and top hats.

2.5 Chevrons

The Color Force 12 fixture has the 'chevron' markings stamped on both ends and printed at the rear enclosure to indicate the side of the fixture that should be adjacent to the wall or cyclorama.



2.6 Chevrons

Color Force 12 fixture can operate as a stand-alone unit or be controlled remotely via ANSI E1.11 USITT DMX512-A protocol. The control functions can be accessed through the LCD display at the rear of the fixture with 4 push buttons.

Push button operation:

Control	Function
Exit	Back to previous menu
Up Arrow	Increases (+) the mode level or value
Down Arrow	Decreases (-) the mode level or value
Back Arrow	(Enter) Stores the menu choice

Power-Up Display:

On power-up and home position, the display shows the model name 'ColorForce12', software version '1.1', the DMX address 'd001', current assigned mode 'RGBA', and the number of channels the Color Force 12 is in '4ch'.

Display Mode:

The LCD is backlit when you access the menus. This will turn off when left undisturbed for 5 seconds.

Control Options:

3 channel HSI (Hue, Saturation and Intensity) gives 2 colour channels for hue and saturation and a separate intensity channel. A separate definable intensity channel is particularly useful when creating intensity chases or when the grand master is used. The hue channel has 255 different colours available and the saturation channel specifies the saturation level of that colour. The saturation channel is fully saturated at full. White is achieved with the intensity channel to full and the saturation channel at zero.

3 channel RGB (Red, Green, Blue with *Magic Amber™) is the more traditional way of controlling colour changing LED fixtures. Each of the three control channels directly affects the intensity of the corresponding LED. Colour is mixed by adjusting the levels of the three primary colours. White is achieved with all channels at full including Magic Amber.

3 channel RGB + 1 intensity channel (Red, Green, Blue with Magic Amber and Intensity) gives 3 control channels directly affecting the intensity of the corresponding LED – Red, Green, Blue with *Magic Amber, and 1 channel affecting the intensity of all RGB(A) channels.

4 channel RGBA (Red, Green, Blue and Amber) gives 4 control channels directly affecting the intensity of the corresponding LED – Red, Green, Blue and Amber. Colour is mixed by adjusting the levels of each of the four colours. White is achieved with all channels at full.

3 channel RGB (Red, Green, Blue with *Magic Amber) + 1 intensity channel + 1 intensity effects channel gives a channel for intensity effects, 3 channels directly affecting the intensity of the corresponding LED – Red, Green, Blue and 1 channel affecting the intensity of all sRGB channels.

4 channel RGBA (Red, Green, Blue, Amber) + 1 intensity effects channel gives a channel for intensity effects and 4 channels directly affecting the intensity of the corresponding LED – Red, Green, Blue, Amber.

3 channel HSI (Hue, Saturation and Intensity) + 4 effects channels gives 2 colour channels for hue and saturation, separate intensity channel and 4 channels for effects (Colour Speed, Range, Step and Intensity Effects).

Grouping options: grouping by individual cell "Duo" and "All" cells. A Color Force 12 fixture consists of 2 cells. Cell grouping "Duo" allows individual control of each single cell. In "All" grouping, both cells can be controlled as 1 group.

Internal FX engine: mode 1, 5 and 6 incorporate internal FX engine with variable parameters to create an unlimited amount of unique lighting effects. (see 2.6 DMX Protocol for list of parameters) All internal FX are referenced back to the base HSI colour and intensity levels.

*Magic Amber is the term used for the unit's ability to bring in amber when mixing colours that require it.

Control Menu

Use the push buttons (up/down arrows) to scroll through the control menu positions:

→ Home / DMX Address

To set the DMX start address, press Enter, press Up/Down buttons to adjust DMX start address, press Enter for 2 seconds to save settings, the display goes back to Home.

→ Control Mode

The Color Force 12 can be set to operate in 11 DMX controlled modes and 2 standalone modes. 2 grouping options are available (cell-grouped ("Duo), all-grouped ("All") with 5 control options: fxHSI, HSI, RGB (with Magic Amber), RGBA, RGBI (with Magic Amber), pre-programmed looks and stand-alone effects. Refer to the list below for details.

Press the Up/Down buttons to access the "Control Mode", press Up/Down to select the mode and press Enter for 2 seconds to save the settings.

Color Force 12

Control Mode - Software Version 1.9

Mode	Name	Group	Ch	Description
1	fxHSI	All	7	4fx + HSI (Colour Speed, Colour Range, Step, Strobe, Hue, Saturation, Intensity)
2	HSI	Duo	6	2 x HSI
3	RGB	Duo	6	2 x RGB (with *Magic Amber)
4	RGBA	Duo	8	2 x RGBA
5	sRGBI	Duo	9	1 intensity fx + 2 x RGBI (*Magic Amber)
6	sRGBA	All	5	1 intensity fx + RGBA
7	HSI	All	3	1 x HSI
8	RGB	All	3	1 x RGB (with *Magic Amber)
9	RGBA	All	4	1 x RGBA
10	RGBI	All	4	1 x RGBI (with *Magic Amber)
11	Look Sel		1	Look Select
12	Mastr StndAlon			Standalone Master
13	Slave StndAlon			Standalone Master

→ When DMX is Lost

If DMX is not detected various output options can be selected:

Press Up/Down to access “When DMX is Lost”, press Enter, press Up/Down buttons to select the options , press Enter for 2 seconds to save.

‘Off’ - will snap to off

‘Hold’ - will hold the last valid DMX state

Look 1-31 will snap to the Look of your choice

→ Look Store

The Color Force 12 has 31 internal preset FX Looks for stand-alone operation, 1-23 are pre-programmed. To replay a Look in stand-alone operation, press Up/Down buttons to access “Look Store”, press Enter, press Up/Down buttons to select the desired Look and press Enter for 2 seconds to save settings.

To replay a Look with a DMX console, press Up/Down buttons to access Control Mode 11 and press Enter for 2 seconds. Use the DMX console with the assigned channel to playback the various looks stored. (1-31 looks in 1 single channel)

Note: DMX has priority over internal Looks.

Looks can be recorded to the internal flash memory by users and will be preserved on power down. However, looks will be returned to default setting if Reset is performed. There are two ways to record a look:

Simple, with DMX console.

Set the Color Force 12 to the desired Control Mode. Use a DMX console to adjust channel levels and create the desired look or effect. Press Up/Down buttons to the “Look Store” and press Enter, press Up/Down buttons to the desired Look number and press Enter. Press Enter again for 2 seconds to save Look.

Advanced, stand-alone. (DMX is unplugged)

Press Up/Down buttons to access “Look Store”, and press Enter, press Up/Down button to the desired Look and press Enter to access the memory data. The data is presented as two numbers separated by a letter “c”. The number to the left of the “c” is the channel number and to the right is the channel level. Pressing Up/Down up to the far end will show the Mode at which the selected Look was programmed.

To edit the Mode of a selected Look:

Press Up/Down buttons to access “Look Store” and press Enter, press Up/Down to the desired Look and press Enter to access the memory data. Press Up/Down buttons up to the far end until Mode number is shown and press Enter. Press Up/Down buttons to adjust the Mode number. Press Enter to toggle back to the channel numbers.

To edit the channel numbers and levels of a selected Look:

Press Up/Down buttons to access “Look Store” and press Enter, press Up/Down to the desired Look and press Enter to access the memory data. Press Up/Down buttons and select the channel number. To edit the channel level, press Enter and use the Up/Down buttons to adjust the level (shown as 0-255). Press Enter to toggle back to the channel number. When the desired effect is created press Enter for 2 seconds to save the edited Look.

→ Technical

In this mode, internal fan speed and frequency settings of the unit can be changed; and pre-programmed engines can be uploaded. Press Up/Down to access “Technical”, press Up/Down to select either “Frequency” or “Upload Engines” or “Fan Speed”.

Frequency:

The Color Force 12 has four frequency settings available - 600, 1200, 2400, 4800. This allows for the LED scan rate to be synchronised with the video camera and avoid a flickering effect. Press the Up/Down buttons to select the desired frequency, press Enter for 2 seconds to save settings.

Upload Engines:

Pre-programmed engines can be uploaded to the Color Force 12 from the Chroma-Q Uploader:

1. Press Enter, Up/Down buttons to select “Upload Engines” then press Enter, and the display will show “Ready”:
2. Connect an XLR 5-pin cable from the Uploader to the unit.
3. Power-up the Uploader - display will show the file name, and “Ready”.
4. Press the “GO” button once to execute the uploading - red indicator light on the “GO” button will blink.
5. The Uploader display will show a simulated arrow moving from left to right indicating the uploading process.
6. All the green LEDs of the unit will light up (low intensity) to indicate completion of a successful Upload and the Uploader display will show “DONE”.
7. Power-cycle the unit.

(See Quick Start Guide of the Chroma-Q Uploader)

Fan Speed:

The Color Force 12 is built with an internal fan with three speed options to regulate noise levels and the cooling process. The “Studio” mode is equivalent to low velocity for quiet application and cooler locations, “Requlal” mode is moderate velocity for standard and less critical locations, and “Live” mode is equivalent to high velocity for louder application and warmer locations.

Press Enter, Up/Down buttons to select “Fan Speed”, then press Enter to select from either “Studio”, “Regular” or “Live”, and then press Enter for 2 seconds to save the settings.

→ Output Setting

The light output of the Color Force 12 can be adjusted to two levels. “Standard 2400Lm” is the maximum light output and “Matching CF48/72” is the light output level that matches the levels of the Color Force 72 and 48 fixtures.

Press Up/Down to access “Output Setting”, then press Enter and Up/Down to select between “Standard 2400Lm” or Matching CF48/72”.

→ Reset to Default

Press Up/Down to access “Reset to Default”, press Enter, display will show “reset?”, press Enter for 2 seconds, display will show “resetting” and “done” when complete, and all menu items are reset to factory defaults:

DMX address = 001, Control Mode = 6 , When DMX is Lost = Hold, Looks = 00,

Frequency = 600, Fan Speed = Studio, Output Setting = Standard 2400Lm.

2.7 DMX Protocol

Color Force 12 DMX Personality Mode 1-3:

Color Force 12	Control Mode 1	Control Mode 2	Control Mode 3 [6ch]
v1.9	[7ch] 4fx + HSI	[6ch] 2 x HSI	2 x RGB (with *Magic Amber)
Channel 1	Colour Speed 0-255 Variable speed of colour scrolling. Static at 0 to max at 255.	Hue group 1	Red group 1
Channel 2	Colour Range 0 Full spectrum 1-255 Variable limit of spectrum for colour scrolling. Single colour at 1, full spectrum at 255.	Saturation group 1	Green group 1
Channel 3	Colour Step	Intensity group 1	Blue group 1

	0-255 Variable control of smoothness of colour scrolling. Smoothest at 0. Most coarse is at 250. Rate will vary with scrolling speed. 255 will override effects and switch to RGB.		
Channel 4	Intensity Effects 0 Static 1-63 Fade on, fade off. Variable, 63 fastest 64-127 Fade on, snap off. Variable, 127 fastest 128-191 Snap on, fade off. Variable, 191 fastest 192-255 Snap on, snap off (strobe). Variable, 255 fastest.	Hue group 2	Red group 2
Channel 5	Hue group 1	Saturation group 2	Green group 2
Channel 6	Saturation group 1	Intensity group 2	Blue group 2
Channel 7	Intensity group 1		
Total	7 DMX channels	6 DMX channels	6 DMX channels

Color Force12 DMX Personality Mode 4-6:

Color Force 12 v1.9	Control Mode 4 [8ch] 2 x RGBA	Control Mode 5 [9ch] 1fx + 2 x RGBl (with *Magic Amber)	Control Mode 6 [5ch] 1fx + RGBA
Channel 1	Red group 1	Intensity Effects 0 Static 1-63 Fade on, fade off. Variable, 63 fastest 64-127 Fade on, snap off. Variable, 127 fastest 128-191 Snap on, fade off. Variable, 191 fastest 192-255 Snap on, snap off (strobe). Variable, 255 fastest.	Intensity Effects 0 Static 1-63 Fade on, fade off. Variable, 63 fastest 64-127 Fade on, snap off. Variable, 127 the fastest 128-191 Snap on, fade off. Variable, 191 fastest 192-255 Snap on, snap off (strobe). Variable, 255 fastest.
Channel 2	Green group 1	Red for group 1	Red for group 1
Channel 3	Blue group 1	Green for group 1	Green for group 1
Channel 4	Amber group 1	Blue for group 1	Blue for group 1
Channel 5	Red group 2	Intensity for group 1	Amber for group 1
Channel 6	Green group 2	Red for group 2	
Channel 7	Blue group 2	Green for group 2	
Channel 8	Amber group 2	Blue for group 2	
Channel 9		Intensity for group 2	
Total	8 DMX channels	9 DMX channels	5 DMX channels

2.8 Thermal Performance

The Color Force 12 fixture is equipped with an internal fan to drive the internal cooling system. If the internal temperature of the Color Force 12 exceeds 75°C the output of the fixture is reduced for automatic protection. This happens on rare and extreme conditions when ambient temperature is over 35°C or the internal fans are blocked or damaged.

The airflow to and from the fan must not be constricted to maintain the maximum operating capacity of the Color Force.

3. Troubleshooting

Troubleshooting is a process of elimination. First, rule out the other field factors (i.e. bad connections, faulty cables and power supplies). For technical support and/or parts, please contact your selling dealer or the offices listed in this manual.

Symptom	Possible Cause	Solution
Fixture does not respond to DMX control.	Set to wrong or different DMX address. Bad cable connecting DMX control and fixture. Bad in/through connection between adjacent fixtures.	Check DMX address and Mode settings. Check/replace DMX run from the console.
Noise from fixture unit.	Fan malfunction.	Check fan.
Low LED output.	Internal temperature is over the limit. Fan is not working.	Check “Fan Control” mode. Check fan. Check for airflow - to and from the internal fan. Check area ventilation.

4. Specification

4.1 Technical specifications

Product code:	CHCF12NFRGBA
Nett dimensions:	335mm x 190mm x 218mm / 13.2” x 7.5” x 8.6”
Nett weight:	4.3kgs / 9.5lbs
Power supply:	Built-in
Power input rating:	100-240V AC, 50-60 Hz, 160VA
Power factor:	0.997
Power consumption:	120W
Typical power & current:	Measurements done with all LEDs at max. intensity. Measurements made at nomincal voltage. Allow for a deviations of +/- 10%
Power connector in/out:	PowerCon
Data connectors in/out:	XLR 5-pin
Max cable run:	NA
Control protocol:	ANSI E1.11 USITT DMX 512-A
Cooling system:	Forced – 1 fan
Operating temperature:	0°C to 40°C
Construction:	Anodised aluminium extrusion
Colour:	Black

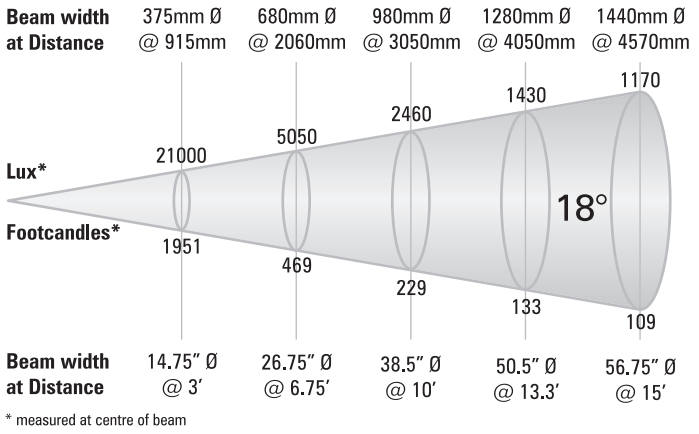
LED engine:	2
LED per engine:	24 (6 x RGBA)
Total LEDs:	48
Optics:	Specialised close focus lens
Beam angle:	~18º
Beam distribution:	Asymmetrical direct illumination
CCT:	Adjustable 1000 – 10000K
CRI:	92
Lamp Life:	L70 up to 50,000 hours
IP Rating:	IP20
Operating temperature:	0ºC to 40ºC
Approvals:	CISPR 22 :2006/EN55022 :2006 & CISPR 24 :1997/EN55024 :1998, ICES-003 :2004 & FCC Part 15 Subpart B: 2007, CSA C22. No. 166-M1983:R2008 UL 1573:2003; UL 8750

CE

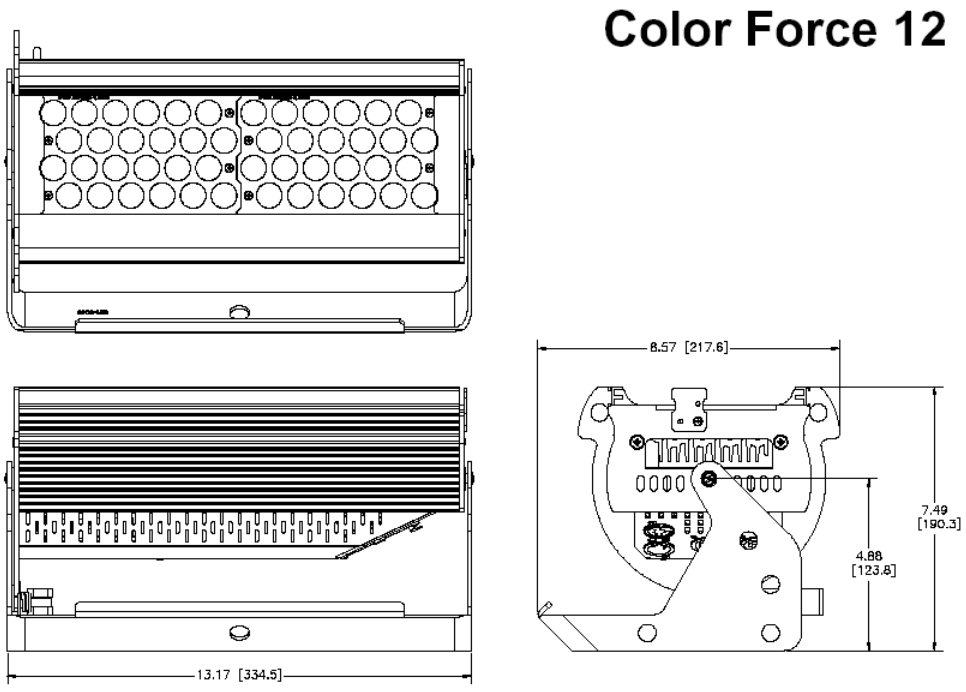
4.2 Illuminance measurements

Lux and footcandle measurements with RGBA at full intensity:

Throw Distance		Center Beam	Beam Width
375mm	LUX	21000	915mm
3'	FC	1951	14.75"
680mm	LUX	5050	2060mm
6.75'	FC	469	26.75"
980mm	LUX	2460	3050mm
10'	FC	229	38.5"
1280mm	LUX	1430	4050mm
13.3'	FC	133	50.5"
1440mm	LUX	1170	4570mm
15'	FC	109	56.75"



4.3 Drawings



5. Maintenance

With care, the Color Force 12 will require little maintenance. However, as the unit is likely to be used in a stage environment we recommend periodical internal inspection and cleaning of any resulting dust and cracked oil residue.

Do not spray liquids on the front or rear panel. If the front enclosure requires cleaning, wipe with a mild detergent on a damp cloth.